

NON-PROVISIONAL APPLICATION

FOR

UNITED STATES LETTERS PATENT

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FOR

GOLF PUTTER HAVING SPACED WEIGHT MEMBER

REFERENCE TO RELATED APPLICATION

This non-provisional patent application is based upon U.S. Provisional Patent Application Serial No. 60/227,741 filed 08/24/2000, and hereby claims the benefit of the
5 filing date thereof.

BACKGROUND OF THE INVENTION

Because of the great interest in golf and golf equipment, there is a continuing effort to devise newer and better golf clubs. This applies to putters, as well as other clubs, and a visit to any well stocked golf professional's shop will disclose a number of designs of golf putters available. Variations include clubs, particularly putters, having heads with various amounts of offset from the shaft, various shapes of head and various weighting arrangements. Great effort has been expended in attempting to distribute the weight on the clubhead so that the club will swing straight and true.

Specifically, most golf putters today are weighted toward the bottom of the club with varying proportions of the weight placed toward the heel or the toe. The desirable weight distribution and the offset or lack of it are all features which give rise to very subjective reactions by individual golfers, which is probably the reason for the number of
20 designs available. There seems to be no agreement as to an optimum putter design. Comparatively, recent putter designs are disclosed in U.S. Patent Nos. 4,693,478; 4,898,387; 5,308,069; and 5,464,218. It does appear, however, that most of the later and more sophisticated designs attempt to arrange the weight around the clubhead to

aid in providing as straight a swing as possible, with the least likelihood of hitting the ball off center, causing the ball to veer from the intended course. Nevertheless, most putters today require that the ball be hit squarely in the center and with the clubhead directly perpendicular to the intended direction of travel of the ball. It would be desirable
5 for most golfers to have golf clubs, and particularly, putters, which are more forgiving of a stroke which is somewhat off center of the clubhead.

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BRIEF SUMMARY OF THE INVENTION

Applicant has devised a golf putter which is believed to be more forgiving of an off-center contact with the golf ball than any heretofore available. This putter utilizes a significant proportion of the clubhead weight in the form of a bar extending parallel to the clubhead and spaced outwardly from the rear part of the clubhead by means of a short support or shaft centered on the bar and the clubhead.

As compared with a clubhead having an identical shape and having the extra weight simply cast into the back of the clubhead, applicant's new club clearly provides enhanced performance, especially in situations where the clubhead strikes the ball off center. The length of the rearwardly extended bar, as shown, is approximately half that of the main part of the clubhead, and a significant amount of testing indicates that the clubhead can hit the ball substantially off center without causing the ball to change its direction. Actually, an even longer bar could improve the clubhead performance somewhat more, but the additional length results in a heavier clubhead and less attractive appearance.

The length of the clubface over which the ball may be hit without causing the ball to be deflected is greater than the length of the spaced bar, as shown. Typically, the clubhead may be 4-7/8" long and the bar centered at the rear is 2-7/16" long. Experience with a putter made according to the invention indicates that improved performance is observed even if the point of impact with the ball is anywhere over the entire length of the striking face. Optimum performance will occur if the ball is hit within the length of the bar and a significantly improved performance is experienced even if

the point of contact with the ball is outside the length of the bar.

In other embodiments, the weight member is mounted from the top of the putter, or near the bottom of the putter, as when it is carried on the soleplate. Applicant has also formed the weight and support as a "T-bar" which is welded into the clubhead with
5 the end of the support flush with the striking face.

Another embodiment utilizes the same basic concept as the embodiments described above but conceals the bar in a chamber within the putter behind the striking face. In this embodiment, the bar or weight is preferably flat, supported at the center of a separate striking face member and unsupported at the ends such that its performance
10 is similar to the other embodiments described above.

In a further embodiment, the clubface is formed with a cavity open to the rear and with the support extending into the cavity from the rear or back side of the striking face. The weight is secured to the support such that it is spaced from the bottom and sidewall of the cavity. The support is configured so that its exposed surface is substantially flush
15 with the rear side of the clubhead, making the weight, if not concealed, at least not apparent to a casual observer.

Other objects and advantages will become apparent from consideration of the following description taken in connection with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

This invention may be more clearly understood with the following detailed description and by reference to the drawings in which

- 5 { Fig. 1 is a rear perspective view of the clubhead according to the invention;
Fig. 2 is a plan view, partly in section, of the clubhead of Fig. 1;
Fig. 3 is a sectional view taken along line 3-3 of Fig. 2;
Fig. 4 is a force diagram indicating the theory of operation of the clubhead of Figs. 1, 2, and 3;

10 { Fig. 5 is a perspective view of another embodiment of the invention in which the rear support and weight are mounted high on the clubhead and formed integrally therewith;

Fig. 6 is a top view of the embodiment of Fig. 5;

15 { Fig. 7 is a side elevational view of an additional embodiment of the invention in which the rear support extends through the striking face of the clubhead;

20 { Fig. 8 is an exploded vertical sectional view of the clubhead of Fig. 7 taken along the centerline of the putter;

Fig. 9 is an exploded view of still another embodiment of the invention with a concealed weight member;

25 { Fig. 10 is a top plan view of the embodiment of Fig. 9 with portions broken away to show the support and weight within a cavity;

Fig. 11 is a fragmentary sectional view taken along line 11-11 of Fig. 10;

30 { Fig. 12 is a side view of a further embodiment of the invention with the support

and weight secured to the sole plate of the clubhead;

Fig. 13 is a top view of the embodiment of Fig. ~~14~~; 12

Fig. 14 is an exploded rear perspective view of a still further embodiment of the invention with a weight member faired into the back side of the clubhead;

5 Fig. 15 is a top view of the clubhead of Fig. 14 with portions broken away;

Fig. 16 is a sectional view taken along line 16-16 of Fig. 15;

Fig. 17 is a front elevational view of the clubhead of Figs. 14-16; and

Fig. 18 is a rear elevational view of the clubhead of Figs. 14-17

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DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to Fig. 1, the putter clubhead **10** is secured to a shaft **12** by means of an integral hosel **12'**. The hosel may also be a separate member attached to clubhead **10**. The clubhead is shown addressing a ball **14**, shown in phantom, on a putting green **16**. The clubhead **10** includes a striking face **18** with a weighted portion **20** formed on the rear side. At the bottom of the weighted portion **20** is a soleplate **21**. The weighted portion **20** extends toward the toe and heel of clubhead **10**, but is cut out or relieved in the upper part of the center, as shown at numeral **22**. A short rod or bar **24** is secured to the rear side of the striking face **18** at the center of the cut out part **18**, which is also essentially at the weight center of the clubhead **10**. An elongated cylindrical weight **26** is secured at its exact center to bar **24**.

Fig. 2 is a plan view of the clubhead **10** showing the clubface **18**, the weighted portion **20**, cutout part **18**, bar **24**, and the elongated cylindrical weight **26**. The integral hosel **12'** is shown in section. Member **26** is conveniently shown as cylindrical, although it could have other cross sections such as hexagonal so long as its weight is evenly balanced on opposite sides of its point of attachment to bar **24**.

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Golf balls **14** and **15** are shown in phantom adjacent to the striking face **18** to indicate that clubhead **10** could strike a ball off center of the clubhead at any point along its length from the location of ball **14** to that of ball **15** without causing the ball to travel off course. As stated above, the point of impact could be even further outboard and the ball will still travel straight. As shown in Figs. 2 and 3, bar **24** is of such length that weight **26** extends rearwardly somewhat beyond the width of the main part of clubhead

10, including soleplate 21. Since bar 24 and weight 26 are normally threadedly engaged with clubhead 10, weight 26 must be able to be turned into clubhead 10 without interference from soleplate 21 with different attachment means, such as welding, bar 24 could be somewhat shorter.

5 Fig. 4 is a simplified force diagram indicating the effect of striking a ball substantially off center with a putter having the clubhead 10. When the clubhead 10 strikes the ball, a force is applied against the clubface 18 as shown by the arrow A. This causes a moment arm tending to turn or pivot the clubface 18 around its center toward the direction of the arrow A. This would normally cause the ball to be deflected from the desired path. With applicant's clubhead, the end of weight 26 on the side of the impact reacts because of its inertia with a compensating force toward the clubface (arrow B) which tends to oppose the tendency of the club to turn.

Figs. 5-13 disclose embodiments not included in the Provisional Patent Application, Serial No. 60/227,741, referred to above.

10 15 20 SUB 22 Fig. 5 is a perspective view of another embodiment of the invention. In this view, the clubhead 30 includes a clubface 32, a soleplate 34, an integral hosel 36, and a rear face 38. Extending from a position high on the rear face is a shaft or support 40 center on an elongated cylindrical weight 42. A top view of this embodiment is shown in Fig. 6. Note that support 40 extends from the top of rear face 38. This embodiment is preferably cast as a single unitary piece.

Figs. 7 and 8 are side elevational views and vertical sectional views, respectively, of a modified form of the clubhead of Figs. 1-3 in which the support 24A and the cylindrical weight 26A form a T-bar which is welded in a hole or port 44 in the portion of

the clubhead containing clubface **18**. The clubhead **10** is bored to receive the stepped cylindrical insert **46** and the insert **46** is secured in place, preferably by welding in place with its tip **46A** flush with clubface **18** preferably at the exact location of the club "sweet spot". Additionally, the weight member **26A**, in the form of an elongated cylinder **26A** is secured to a circular boss at the outer end of support **24A** as by welding, brazing or epoxy bonding.

Fig. 9 is an exploded view of still another embodiment of the invention in which the spaced weight member is concealed within a clubhead **50**, which is hollowed out to form a chamber **52** extending over most of its length. Clubhead **50** may contain additional bores **54**, **56** for receiving additional weight members (not shown). A cylindrical support member **58** carries an elongated weight **60** and is seated in a bore **62** centered in a faceplate **64**. A bore **65** provides a means for attaching a separate hosel and/or shaft.

Fig. 10 is a top view of the clubhead **50** of Fig. 9 showing the chamber **52**, bores **54** and **56**, support member **58**, and weight member **60** in phantom; and Fig. 11 is a sectional view taken along line 11-11 of Fig. 10. For clarity, the spacing between weight member **60**, the back face **53** of chamber **52**, and the faceplate **64** is somewhat exaggerated, the normal spacing being in the order of 0.015 to 0.020 in. Weight member **60** would normally be of a material such as tungsten, which is substantially heavier than the other material of clubhead **50**, which may be of aluminum. It will be recognized that the ends of weight member **60** are unsupported and free to respond to the impact of the clubhead **50** on a golf ball just as described in connection with Fig. 4. Once the parts are in position, as shown, they are secured by welding or by an epoxy

adhesive.

Fig. 12 is a perspective view of a further embodiment of the invention in which the clubhead **70** is preferably cast as a single unitary piece, including a hosel **71**, and the elongated weight member **72** is supported on the soleplate **74** of the clubhead. In this embodiment, the support **73** may be integral with or directly supported on the rearwardly extending soleplate **74**.

The clubheads described have been formed of 431 stainless steel, but they can be formed of any material in common use for manufacturing putters, such as various alloys of aluminum, titanium or brass.

~~Fig. 13 is a top view of the clubhead **70** of Fig. 12.~~

Fig. 14 is an exploded rear perspective view of an embodiment of the invention in which the weight is faired into a cavity or chamber **68** on the back side of a clubhead **70** which includes a soleplate **71**. A weight member **72** is supported on a short shaft or support **74**, which is welded or otherwise secured to the striking face **76** of clubhead **70**. A small collar **78** on support **74** spaces weight member **72** away from the bottom or vertical wall **79** of cavity **68**. Weight member **72** is sized to provide for a small clearance, such as 0.010 to 0.020 inch between its edge surface **80** and the sidewall **82** of cavity **68**. It will thus be appreciated that the weight **72** is unsupported on its ends and has clearance all around its edges and is therefore free to respond to an impact with a golf ball in the same manner as described above. The weight member **72** is smoothly faired into the back surface of the clubhead in such manner that it is not readily apparent that it is a separate weight. A shaft of hosel **83** is secured to clubhead **70**.

Fig. 15 is a top view of clubhead 70 with a portion of its top broken away along with a portion of weight member 72 to show the manner in which collar 78 on support 74 serves to space weight member 72 away from the vertical wall 79 of cavity 68. Again, the clearance between cavity sidewall 82 and weight member 72, and between vertical wall 79 and weight member 72 is somewhat exaggerated for clarity. The support 74 is shown welded to the striking face 76 at numeral 84.

Fig. 16 is a sectional view taken along line 16-16 of Fig. 15. Visible in this view are clubhead 70, weight member 72, and support 74 with collar 78. The wall 79 of cavity 68 is shown along with sidewall 82. Welds 84 are also shown.

Figs. 17 and 18 are front and rear elevational views, respectively, of clubhead 70. Although support 74 is welded to striking face 76, this connection would be barely visible, if at all, on a finished clubhead, as shown in Fig. 17. Hosel 83 is shown secured to clubhead 70.

Fig. 18 shows clubhead 70, soleplate 71, hosel 83, and weight member 72 with weight member 72 shown clear of sidewall 82.

The above-described embodiments of the present invention are merely descriptive of its principles and are not to be considered limiting. The scope of the present invention instead shall be determined from the scope of the following claims including their equivalents.